

REDISCOVERY OF *TEPHROSIA JAMNAGARENSIS*
(FABACEAE), AN ENDANGERED AND NARROW ENDEMIC
PLANT SPECIES OF SAURASHTRA, GUJARAT, INDIA

P.S. Nagar

Department of Biosciences
Saurashtra University
Rajkot-360 005, INDIA

S.J. Sata

Department of Biosciences
Saurashtra University
Rajkot-360 005, INDIA

S.J. Pathak

Department of Biosciences
Saurashtra University
Rajkot-360 005, INDIA

ABSTRACT

During recent botanical explorations of Saurashtra, Gujarat, India, the narrowly endemic plant species *Tephrosia jamnagarensis* was rediscovered after a lapse of 3 decades. A full description of the species is provided along with photographs; a key to closely related species is included.

RESUMEN

Durante exploraciones botánicas recientes en Saurashtra, Gujarat, India, la especie endémica *Tephrosia jamnagarensis* fue redescubierta después de un intervalo de tres décadas. Se ofrece una descripción completa de la especie junto con fotografías y se incluye una clave para las especies relacionadas más próximas.

INTRODUCTION

During a floristic survey of Jamnagar District (Nagar 2002), *Tephrosia jamnagarensis* Santapau—an endangered and endemic species of Saurashtra (Kothari & Hajra 1983; Nayar & Sastry 1988; Santapau 1958; Shah 1983)—was collected from the lower slopes of the Khad Khambhaliya Vidi (Grassland), Lalpur Taluka, Jamnagar District, Gujarat, India. Fieldwork in 2001 verified the occurrence from Jamnagar District, though not from the same locality.

Tephrosia jamnagarensis was not recognized as a distinct species in earlier floras of the state (Cooke 1901–1903; Thaker 1910). The specific epithet *jamnagarensis* refers to the type locality.

The species was collected for the first time by Santapau (*Santapau 7522*) near Rozi, Jamnagar District, Gujarat, India in 1945 (Santapau 1958) and for the second time some 11 years later (24 Aug 1954) from Victoria Bridge, Jamnagar District (Santapau 1962). A few plants were collected in 1972 from wastelands near the cultivated fields of Bhadbhut, close to Bharuch (South Gujarat), a different sub-humid geographical region (Shah 1978; Vyas 1973). A recent survey

for *T. jamnagarensis* in these same locations did not locate it. The areas have been mostly converted to agricultural land (Nagar 2000; Rao 2002). The recent collections of *T. jamnagarensis* represent not only the rediscovery of this very interesting taxon—after a gap of almost 3 decades—but are also the first available collections that allow for a full description of the flower.

With this recent collection in flower and fruit, a detailed description of the species with floral characteristics, phenology, and habit and habitat distribution is given; photographs are provided.

DESCRIPTION OF *TEPHROSIA JAMNAGARENSIS* AND ITS
COMPARISON WITH *TEPHROSIA STRIGOSA*

Tephrosia jamnagarensis Santapau in Proc. Natl. Inst. Sci. India 24B:133, t. 1. 1958. (**Fig. 1**). TYPE: INDIA. GUJARAT. Jamnagar District: near Rozi, 16 Oct 1945, Santapau 7522 (HOLOTYPE: BLAT).

Erect or suberect, annual herb; stems simple or sparsely branched, covered with whitish appressed hairs. Leaves simple, 3–5.2 × 5–9 mm, linear, glabrous adaxially, densely hairy with silvery appressed hairs abaxially, subobtusate and clearly apiculate at apex, acute at base; lateral nerves 25–30 pairs, parallel; margin entire, with a nerve running from near the base to the apex very near the margin; the nerves covered with hairs, distinct on the adaxial surface, equally distinct on the abaxial surface. Petioles 2–3 mm, hairy; stipules subulate, 3–4 mm, hairy. Flowers single or in pairs, axillary; pedicels 2–3 mm, about as long as the petioles, densely hairy. Calyx, 1–3 mm, hairy, the teeth subulate, filiform, subequal. Corolla mauve, 2.5–3 mm (standard 3 mm, wings 2–2.5 mm, keel 2.5 mm). Legumes compressed, ca. 20 × 5 mm, densely and patently hairy with grayish tinge, oblique at both ends, apiculate; seeds 5–6, reniform, dull or matt, brownish.

Tephrosia jamnagarensis is similar to *T. strigosa* (Dalz.) Sant. & Mahesh, differing mainly by its broader (twice as broad as in *T. strigosa*), densely pubescent pods and by its larger leaves with densely appressed hairs on the abaxial surface, which is clearly silvery or densely argenteo-canescens, making it very distinct from *T. strigosa*. The pedicels are shorter and stouter than in *T. strigosa*. The seeds are not separated by any internal partition (partitioned in *T. strigosa*).

Voucher specimens: **INDIA. Gujarat. Jamnagar District:** Lalpur Taluka: Khad khmbaliya Vidi (Grassland), 17 Oct 2001, P.S. Nagar 1221, 1222, 1234, 1235 (SAUUNI= Saurashtra University).

Additional specimens examined: **INDIA. Gujarat. Jamnagar District:** near Rozi, 16 Oct 1945, Santapau 7522 (HOLOTYPE: BLAT); Bhadbhut, 12 Oct 1972, K.J. Vyas 3095 (spu); Bharuch, 18 Sep 1972, K.J. Vyas 2664 (spu); 21 Sep 1972, K.J. Vyas 2946 (spu). Specimens other than the holotype are deposited in the herbarium of Department of Biosciences, Sardar Patel University (spu), Vallabhvidyanagar, Gujarat, India.

Phenology and Associated Species.—The plants were in flower from September to October, in fruit, from October to November. They grew in grassland with

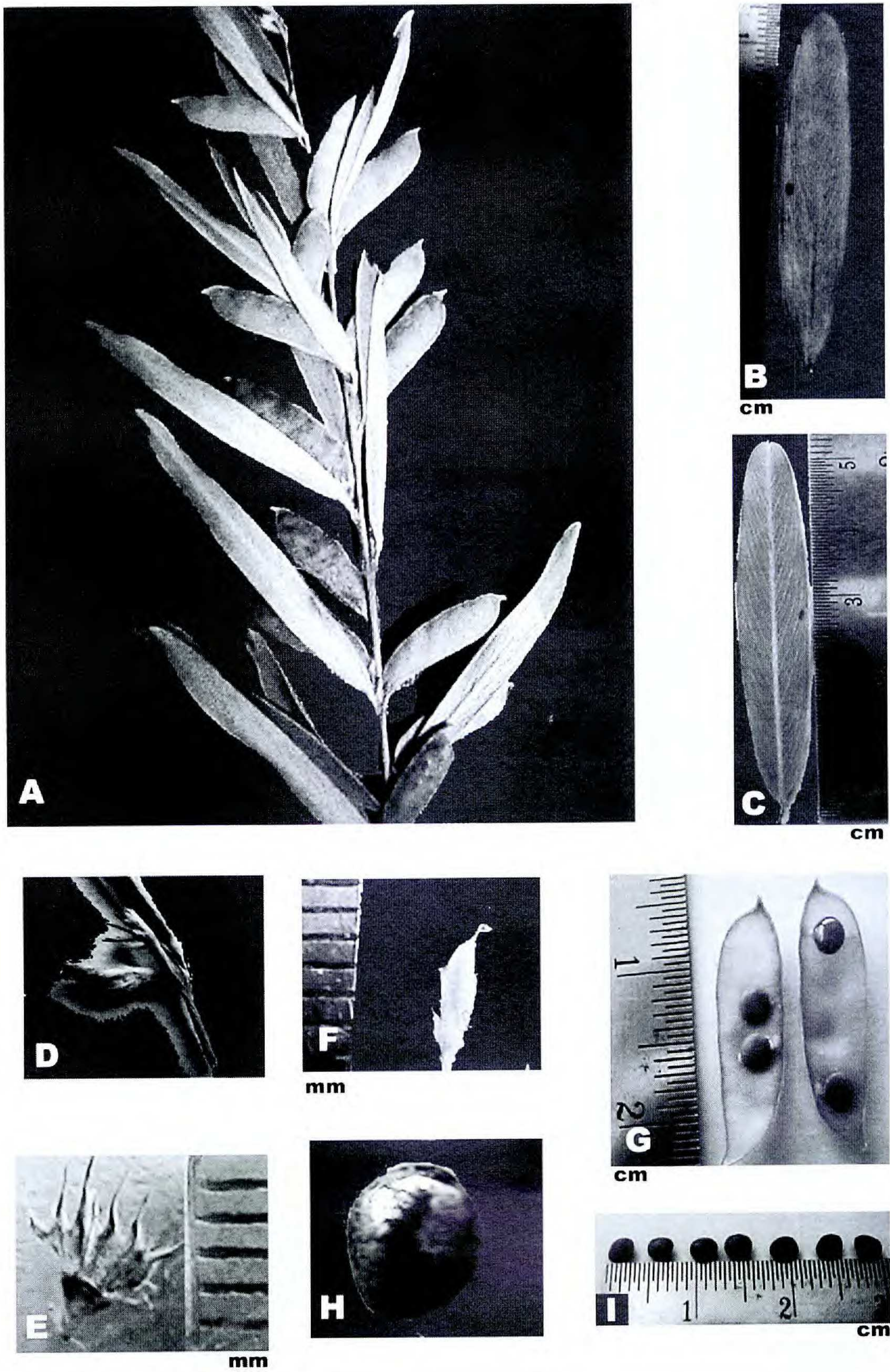


FIG. 1. *Tephrosia jamnagarensis* Santapau A. Habit, Leaf; B. Adaxial surface; C. Abaxial surface; D. Flowering twig; E. Calyx; F. Ovary; G. Pod; H. Seed ornamentation; I. Seeds.

Chrysopogon fulvus (Spr.) Choiv., *Sehima nervosum* (Rottl.) Stapf, *Heteropogon contortus* (L.) P. Beauv. ex R. & S., *Aristida* sp., *Borreria stricta* (L.f.) K. Schum, *Zornia diphylla* auct., *Indigofera cordifolia* Heyne ex Roth, *Indigofera tinctoria* L., and *Alysicarpus vaginalis* (L.) DC.

Habitat and Population Status.—The plants were growing on calcareous gravelly soil. The species is very rare. A quantitative analysis of the population indicated an estimated density of 0.24 plants/m² and frequency of occurrence of 6% (India: Gujarat. Jamnagar District. Khadkhambaliya Region, Lalpur Taluka (Nagar 2002). The rarity of the plant is probably due to overgrazing, habitat destruction, lack of protection, and probably other biotic factors. The plant has been listed as rare under threat category (Botanical Survey of India 1993; WCMC 1994).

Distribution.—The geographical range of *T. jamnagarensis* Sant. is restricted to two separate regions: the western group of populations in northwestern Jamnagar (Rozi and Khadkhambaliya) and the southern population in southwest Bharuch.

Potential Value.—Several species of *Tephrosia* [e.g., *T. purpurea* (L.) Pers.] are sometimes grown as green manure and as cover crops (Santapau 1962); *T. purpurea* is useful medicinally [the whole plant is used internally as purgative, laxative, and tonic; externally it is applied on skin boils (Thaker 1910)]. It is likely that *T. jamnagarensis* may also have similar properties.

ACKNOWLEDGMENTS

We thank the Department of Biosciences, Saurashtra University, Rajkot, for financial support; S.M. Almeida for providing access to the Blatter Herbarium (BLAT), Mumbai, India and for confirming our identification of the species; and A.S. Reddy for giving access to the Departmental Herbarium, Department of Biosciences, Sardar Patel University, Vallabh Vidyanagar, India.

REFERENCES

- BOTANICAL SURVEY OF INDIA. 1983. Materials for a catalogue of threatened plants of India. Howrah. P. 45.
- COOKE, T. 1901–1903. The flora of the Presidency of Bombay. Botanical Survey of India. Howrah. 1:611.
- KOTHARI, M.J. and P.K. HAJRA. 1983. Materials for a catalogue of threatened plants of India. Bot. Surv. India, Howrah. P. 45.
- NAGAR P.S. 2000. Biodiversity of Barda Hills and their surroundings. Ph.D. thesis. Saurashtra University, Rajkot, Gujarat, India.
- NAGAR P.S. 2002. Medicinal plants of Saurashtra Region. Final Report, GEER Foundation, Gandhinagar.
- NAYAR, M.P. and A.R.K. SASTRY. 1988. Red data book of Indian plants, Vol. II, Bot. Surv. India. Howrah. P.133.

- RAO, V.R. 2002. An assessment of endangered plants of Gujarat. Ph.D. thesis. S.P. University, Vallabh Vidyanagar, Gujarat, India.
- SANTAPAU, H. 1958. Addition and corrections to the indo-Nepalese flora. Proc. Natl. Sci. Inst. India 24B:133. t. 1
- SANTAPAU, H. 1962. The flora of Saurashtra Part- I (Ranunculaceae to Rubiaceae), Saurashtra Research Society, Rajkot. P. 270.
- SHAH, G.L. 1978. Flora of Gujarat. Part I, Sardar Patel University, Vallabh Vidyanagar. P. 248.
- SHAH, G.L. 1983. Rare species with restricted distribution in South Gujarat, In: S.K.Jain and R.R. Rao, eds. An assessment of threatened plants of India. Bot. Surv. India, Calcutta. Pp. 50–54.
- THAKER, J.I. 1910. Vanaspati Sastara-Barda Dungar ni Jadibuti tani Pariksha anae Upyog. (BOTANY—A complete and comprehensive account of the flora of Barda Mountain (Kathiawad), Gujarati Printing Press, Bombay. P. 717. (2nd revised ed.; ed. B.G. Shah (1952), Sastu Sahitya Vardhak Karyalaya, Ahmedabad. P. 733).
- VYAS, K.J. 1973. Contribution to the floristics and phytosociology of the river Narmada in Gujarat State. Ph.D. thesis. S.P. University, Vallabh Vidyanagar, Gujarat.
- WCMC 1994. Threatened plants of the World. <http://www.wcmc.org.uk/species/plants/redlists.htm>.